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The M of MONS

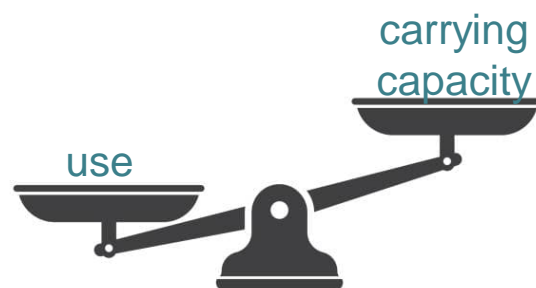
a new layer of monitoring for the future of the North Sea

28 november 2022

North Sea in transition



- Change and increase in use of the North Sea



- Insight into the significance of that changed use requires (intense) monitoring

Current monitoring effort

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- Already substantial amount of monitoring
- Not tailored to effectively monitor the impacts of changing North Sea usage.

- Lack of long-term monitoring of plankton composition and primary production
- Insufficient spatial and temporal coverage while the changed use of the North Sea results in a more heterogeneous system

Fytoplankton:	Kader	Frequentie	
Fytoplanktonsoortensamenstelling	Zwemwaterkwal.	lopend	Monitoring op 3 kuststations i.v.m. zwemwaterkwaliteit
Pigmenten (chl-a/b, feofytine-a/b)	MWTL	1990-loopt nog	Monitoring (4-18x per jaar, afh. locatie)
Fytoplanktonsoortensamenstelling	MWTL	1990-2018	Monitoring (4-18x per jaar, afh. locatie)
Pigmentensamenstelling	Project	Regelmatig, geen tijdreeks	Afhankelijk van project
Pigmenten (chl-a)	NIOZ-jetty	1974-	Monitoring, 40x per jaar
Fytoplanktonsoortensamenstelling	NIOZ-jetty	1974-	Monitoring, 40x per jaar
Continuous Plankton Recorder	CPR programma	Gestart ±1950 en loopt nog	Regelmatige transecten met koopvaardij schepen met maaswijdte van 270 um en niet geschikt op fytoplankton. Data betreffen de relatieve dichtheden.
Primaire productie:			
Pelagische productie	Project	Regelmatig, geen tijdreeks	Afhankelijk van project
Pelagische productie	NIOZ-jetty	2015-2017/18	Continue metingen met FRRF
Bentische productie	-	-	Geen schattingen beschikbaar

Monitoring boost (2025-2030)

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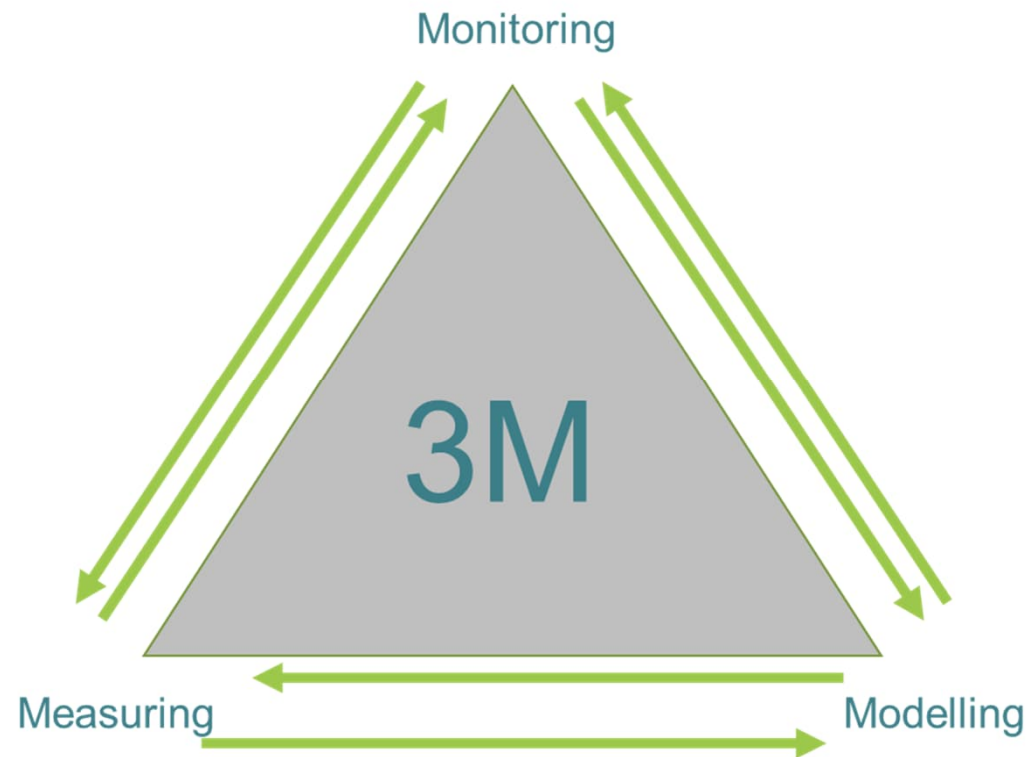


- Expanding the range of monitored parameters
- Increase in temporal and spatial coverage
- Develop and test a new monitoring approach for potential integration into regular campaigns.

Data need



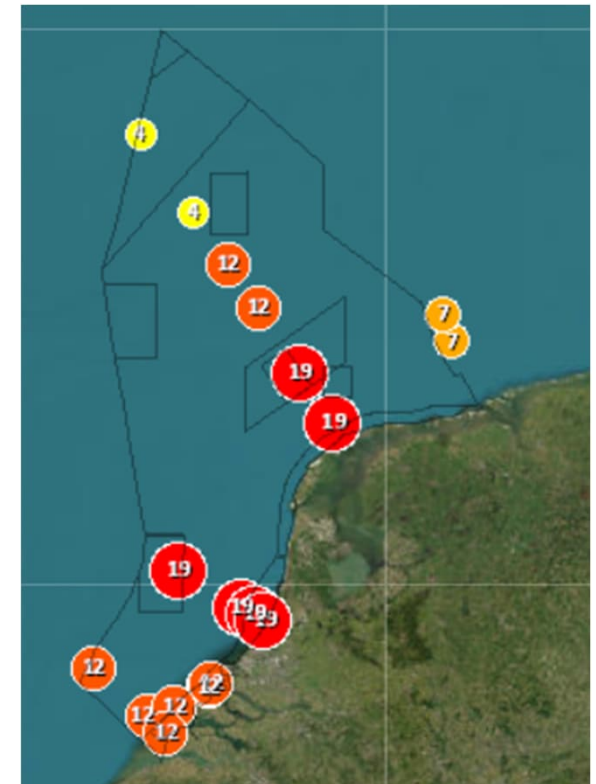
- **Primary Production parameters**
 - Fytoplankton samenstelling
 - Primaire productie
 - Total chlorophyll
 - Oxygen
 - Turbidity
 - CDOM fluorescentie
 - Global radiation
- **Nutrients**
 - NO₃
 - NH₄
 - o-PO₄
 - SiO₂
- **Zoöplankton samenstelling**
- **Physical parameters**
 - Conductivity / Salinity
 - Temperature
- **Carbonate parameters**
 - pH
 - pCO₂



Two 'new' monitoring platforms

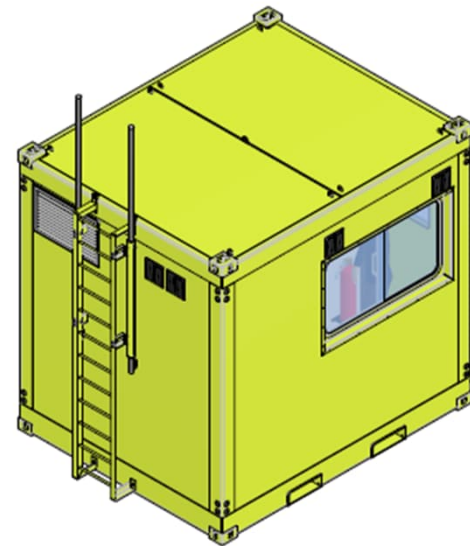


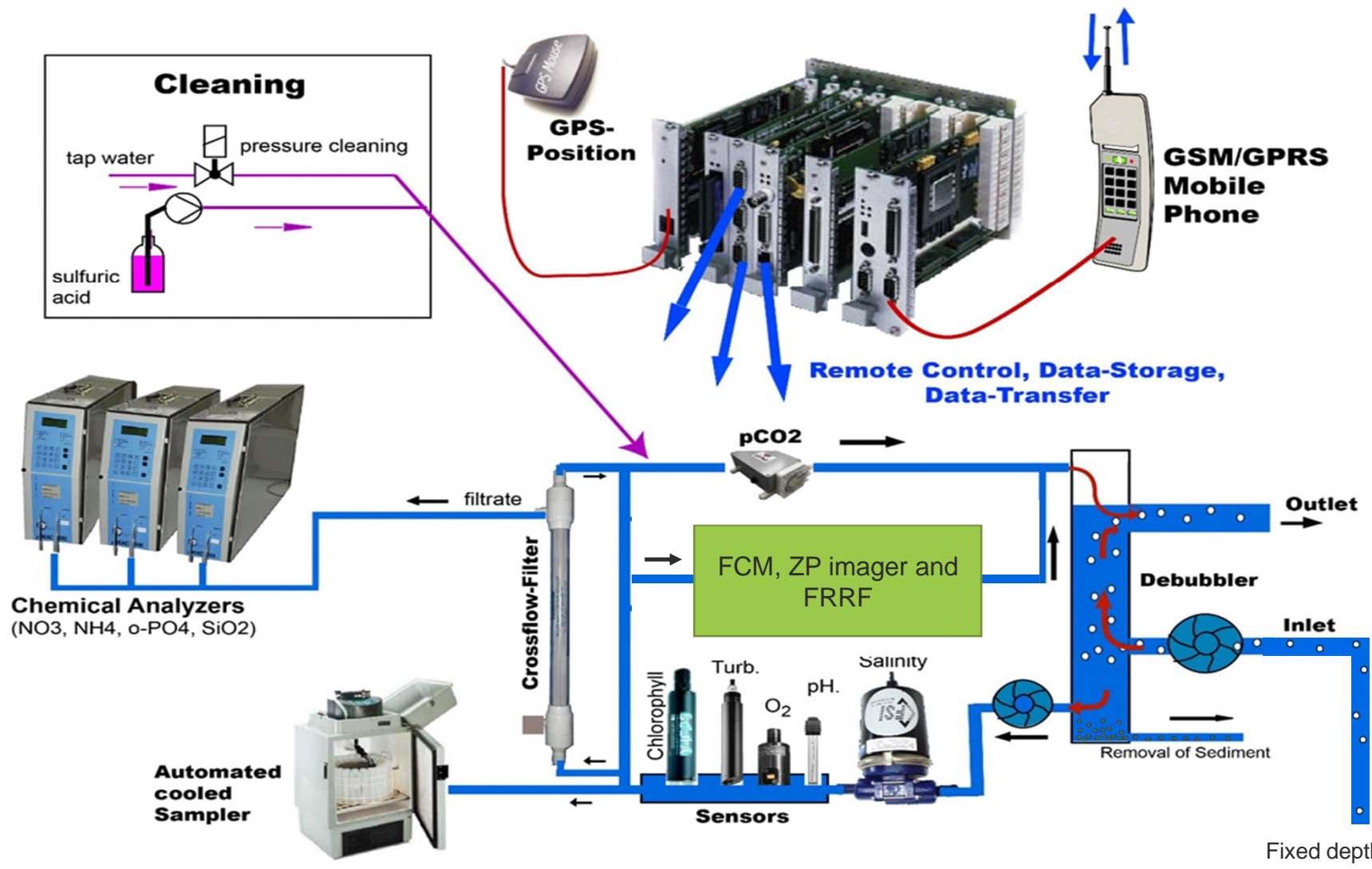
- Temporal: measuring buoys MWTL locations
- Spatial: FerryBox monitoring during MWTL campaign

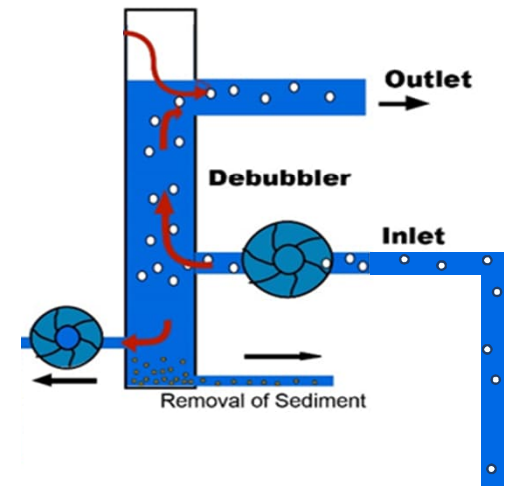


FerryBox Zirfaea

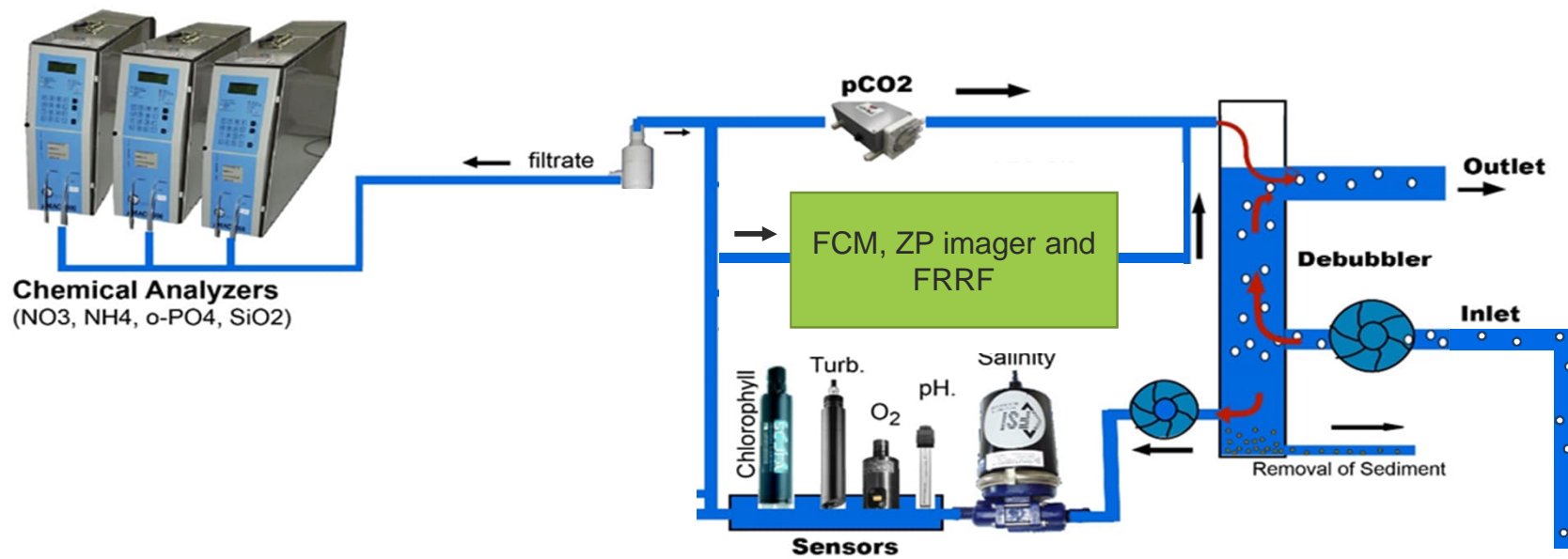
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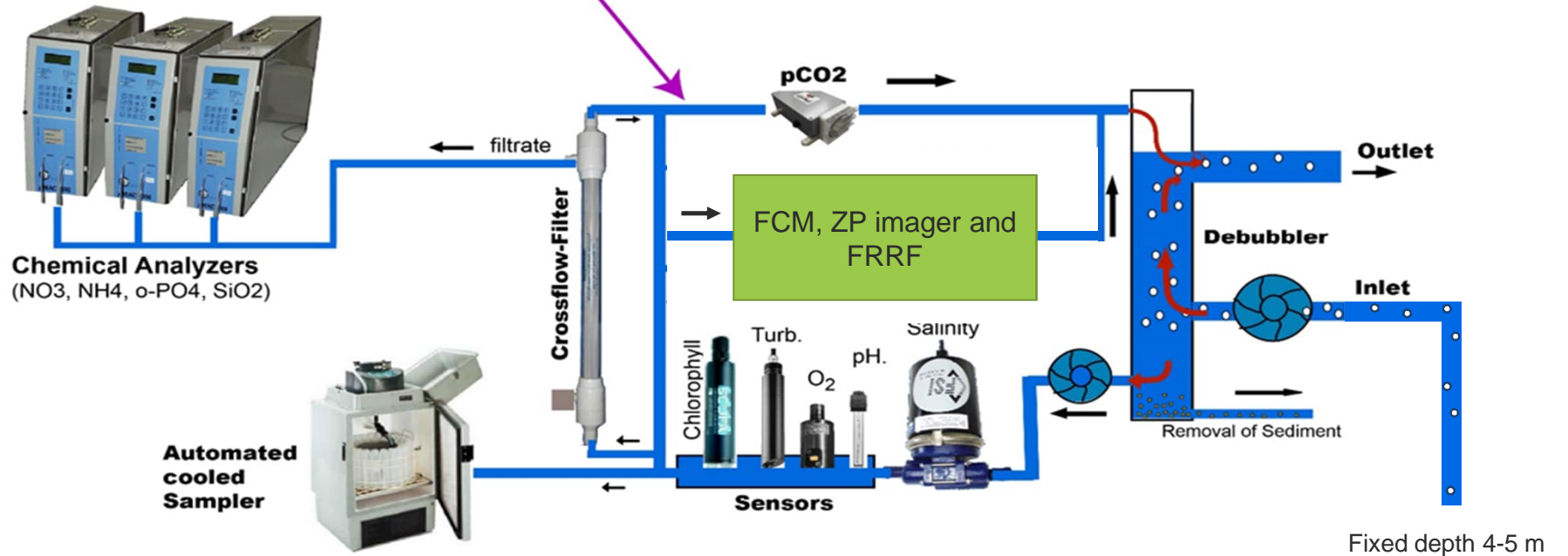
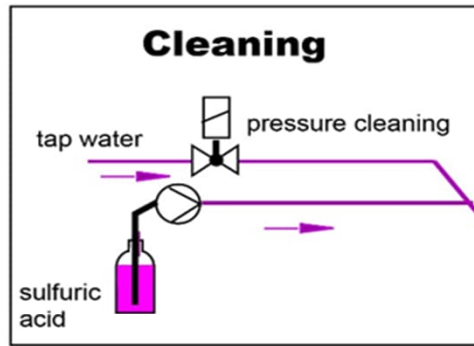


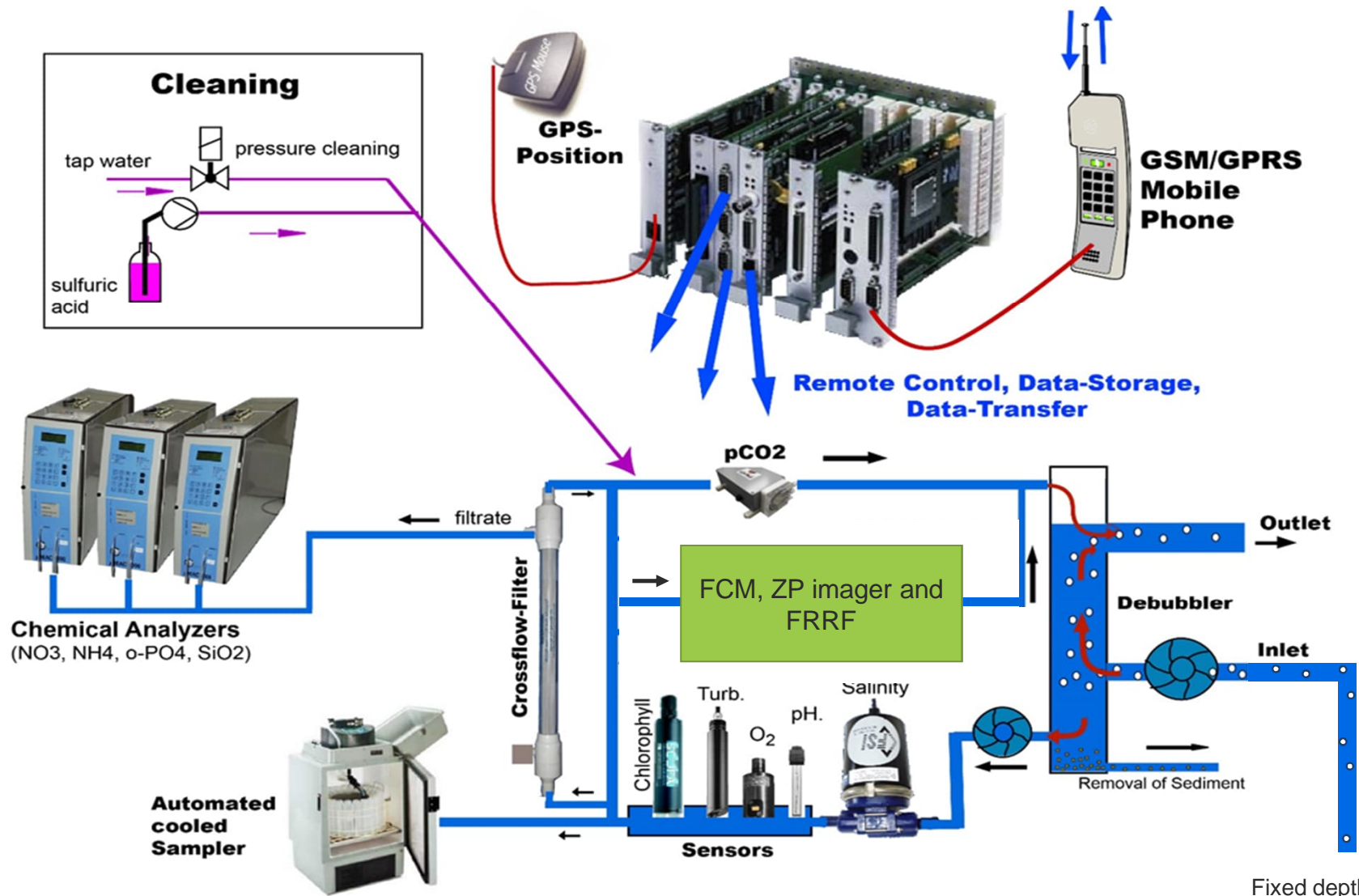


Fixed depth 4-5 m



Fixed depth 4-5 m





European Procurement FerryBox Zirfaea

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- Design and construction (integration on Zirfaea)
 - Maintenance (until 2030, intent to extend beyond)
 - Coordination of calibration and validation
 - Role in performance management and quality assurance of data
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- Expected operational readiness is January - February 2025

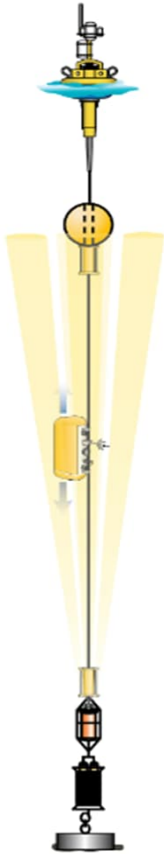
FerryBox SC Connector



- Operational since 2021
- NIVA + Rijkswaterstaat
- Largely same sensors and instruments as Zirfaea



Stationairy monitoring buoys



- Continuous monitoring
- Same parameters as FerryBox
- Vertical profile water column (FB fixed depth)
- 4 to 15 buoys
- MWTL locations

